

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appln. No: To Be Assigned  
Applicant: Kevin K. Lehmann et al.  
Filed: Herewith  
Title: TAPERED FIBER OPTIC STRAIN GAUGE USING CAVITY RING-DOWN  
SPECTROSCOPY  
TC/A.U.:  
Examiner:

**INFORMATION DISCLOSURE STATEMENT**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 C.F.R. §§ 1.97 and 1.98 and to the duty of disclosure set forth in 37 C.F.R. § 1.56, the Examiner in charge of the above-identified application is requested to consider and make of record the references listed on the PTO 1449 (R&P) submitted herewith.

Although the information submitted herewith may be "material" to the Examiner's consideration of the subject application, this submission is not intended to constitute an admission that such information is "prior art" as to the claimed invention.

In accordance with 37 C.F.R. § 1.97(g), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made.

Under 37 C.F.R. § 1.98(d), copies of the patents and publications listed on the enclosed PTO Form 1449 are not required to be provided, because they were cited by or submitted to the Patent and Trademark Office in prior application Serial No. 10/157,400, filed May 29, 2002, which is relied upon for an earlier filing date under 35 U.S.C. § 120. We are enclosing a copy of two references which were not previously cited or submitted to the Patent and Trademark Office in application number 10/157,400.

This Information Disclosure Statement is being filed concurrently with the above-referenced application.

Respectfully submitted,

  
Jacques L. Etkowicz, Reg. No. 41,738  
Attorney for Applicants

JLE/gb

Enclosures: PTO Form 1449  
(2) References  
Transmittal Form

Dated: August 20, 2003

P.O. Box 980  
Valley Forge, PA 19482-0980  
(610) 407-0700

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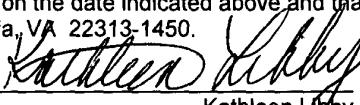
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Kathleen Lippy

Substitute for Form 1449A/PTO		<b>Complete if Known</b>	
		Application Number	To be Assigned
		Filing Date	Herewith
		First Named Inventor	Kevin K. Lehmann et. al.
		Art Unit	Unknown
		Examiner Name	Not Yet Assigned
INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(Use as many sheets as necessary)</i>		SHEET 1 of 4	Attorney Docket No. PRU-103US

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number Number - Kind Code <sup>2</sup> (if known)	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		US-1,719,443	07/02/1929	Nitchterlein	Entire Document
		US-3,402,364	09/17/1968	De Lang	Entire Document
		US-3,711,788	01/16/1973	Forkner	Entire Document
		US-3,976,368	08/24/1976	McCann et. al.	Entire Document
		US-3,982,203	09/21/1976	De Wit	Entire Document
		US-4,161,436	07/17/1979	Gould	Entire Document
		US-4,525,034	06/25/1985	Simmons	Entire Document
		US-5,578,793	03/25/1986	Kane et. al.	Entire Document
		US-4,677,639	06/30/1987	Sasser	Entire Document
		US-4,740,986	04/26/1988	Reeder	Entire Document
		US-4,746,210	05/24/1988	Gould	Entire Document
		US-5,026,991	06/25/1991	Goldstein et. al.	Entire Document
		US-5,267,548	01/04/1994	Margalith	Entire Document
		US-5,463,493	10/31/1995	Shah	Entire Document
		US-5,483,342	01/09/1996	Rockwell	Entire Document
		US-5,528,040	06/18/1996	Lehmann	Entire Document
		US-5,532,493	07/02/1996	Hale et. al.	Entire Document
		US-5,835,231	11/10/1998	Pipino	Entire Document
		US-5,912,740	6/15/1999	Zare et. al.	Entire Document
		US-5,973,864	10/26/1999	Lehmann et. al.	Entire Document

FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document Country Code <sup>3</sup> - Number <sup>4</sup> - Kind Code <sup>5</sup> (if known)	Publication Date (MM-DD-YYYY)	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		63013386	01/20/1988	Japan (Abstract Only)	Entire Document <input type="checkbox"/>
		DE19814575	10/07/1999	Germany	Entire Document <input type="checkbox"/>
		WO93/07469	04/15/1993	PCT	Entire Document <input type="checkbox"/>
		EP 1195582	04/10/2002	EPO	Entire Document <input type="checkbox"/>
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<sup>2</sup>See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04.

<sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard St.3).

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	Application Number	To be Assigned
	Filing Date	Herewith
	First Named Inventor	Kevin K. Lehmann et. al.
	Art Unit	Unknown
	Examiner Name	Not Yet Assigned
<b>SHEET 2 of 4</b>	Attorney Docket No.	PRY-103US

## **U.S. PATENT DOCUMENTS**

## FOREIGN PATENT DOCUMENTS

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Substitute for Form 1449B/PTO		<b>Complete if Known</b>	
<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		Application Number	To be Assigned
		Filing Date	Herewith
		First Named Inventor	Kevin K. Lehmann et. al.
		Art Unit	Unknown
		Examiner Name	Not Yet Assigned
SHEET 3 of 4		Attorney Docket No.	PRU-103US

<b>NON-PATENT LITERATURE DOCUMENTS</b>			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>2</sup>
		J. White, Long Optical Paths of Large Aperture, 32 <i>J. Opt. Soc. Amer.</i> , 285 (May, 1942).	<input type="checkbox"/>
		D. Herriott et. al., Off-Axis Paths in Spherical Mirror Interferometers, 3 <i>Appl. Opt.</i> (4), 523 (Apr., 1964).	<input type="checkbox"/>
		A. O'Keefe & D. Deacon, Cavity Ring-Down Optical Spectrometer for Absorption Measurements Using Pulsed Laser Sources, 59 <i>Rev. Sci. Instrum.</i> , 2544 (Dec., 1988)	<input type="checkbox"/>
		D. Romanini & K. Lehmann, Ring-down Cavity Absorption Spectroscopy of the Very Weak HCN Overtone Bands with Six, Seven, and Eight Stretching Quanta, 99 <i>J. Chem. Phys.</i> (9), 6286 (Nov.1, 1993).	<input type="checkbox"/>
		G. Rempe et. al., Measurement of Ultalow losses in an Optical Interferometer, 17 <i>Opt. Letters</i> (5), 363 (Mar. 1, 1992).	<input type="checkbox"/>
		T. Yu & M. Lin, Kinetics of Phenyl Radical Reactions Studied by the "Cavity-Ring-Down" Method, 115 <i>J. Am. Chem. Soc.</i> , 4371 (1993).	<input type="checkbox"/>
		G. Meijer et. al., Coherent Cavity Ring down Spectroscopy, 217 <i>Chemical Physics Letters</i> (1,2), 112 (Jan. 7, 1994).	<input type="checkbox"/>
		J. Scherer et. al., Cavity Ring Down Dye Laser Spectroscopy of Jet-Cooled Metal Clusters: CU <sup>2</sup> and CU <sup>3</sup> , 172 <i>Chemical Physics Letters</i> (3,4), 214 (Sep. 7, 1990).	<input type="checkbox"/>
		F. Stoelkel & G. Atkinson, Time Evolution of a Broadband Quasi-cw Dye Laser: Limitation of Sensitivity Intracavity Laser Spectroscopy, 24 <i>Applied Optics</i> (21), 3591 (Nov. 1, 1985).	<input type="checkbox"/>
		K. Lehmann & D. Romanini, Molecules in the Stellar Environment, <i>Experimental Measurements of Weak Band Intensities in Molecules in the Stellar Environment</i> , (Springer, 1994).	<input type="checkbox"/>
		G. Gould et. al., Crossed roof Prism Interferometer, 1 <i>Applied Optics</i> (4), 533 (July 1962).	<input type="checkbox"/>
		A. Pipino et. al., Evanescent Wave Cavity Ring-Down Spectroscopy with a Total-Internal Reflection Minicavity, 68 (8) <i>Rev. Sc., Instrum.</i> , (August 1997).	<input type="checkbox"/>
		Stewart G. Atherton K, Yu H, Culshaw B. "An investigation of an optical fibre amplifier loop for intracavity and ring-down cavity loss measurements." <i>Meas. Sci. Technol.</i> 12: 843-849 (2001).	<input type="checkbox"/>
		Dmitriev AL, Yanson Z, Xinyu M. "Optical-fiber passive ring resonator in a low-mode radiation-propogration regime." <i>J. Opt. Technol.</i> 67:219-221 (2000).	<input type="checkbox"/>

Examiner Signature	Date Considered
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		Art Unit	Unknown
		Examiner Name	Nay Yet Assigned
SHEET 4 of 4		Attorney Docket No.	PRU-103US

**NON-PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>2</sup>
		Blair S, Chen Y. "Resonant-enhanced evanescent-wave fluorescence biosensing with cylindrical optical cavities." <i>Applied Optics</i> . 0: 570-582 (2001).	<input type="checkbox"/>
		Littlejohn D, Lucas D, Han L. "Bent Silica Fiber Evanescent Absorption Sensors for near-Infrared Spectroscopy." <i>Applied Spectroscopy</i> . 53: 845-849 (1999).	<input type="checkbox"/>
		Messica A, Greenstein A, Katzir A. "Theory of fiber-optic evanescent-wave spectroscopy and sensors." <i>Applied Optics</i> 35: 2274-2284 (1996).	<input type="checkbox"/>
		Trautmann et. al., "Determination of the Deuterium Abundance in Water Using a CW Chemical DF Laser". <i>Appl. Phys.</i> , 24: No. 1, 49-53 (1981).	<input type="checkbox"/>
		Spammer, S, Swart, P, Boosyen, A. "Interferometric distributed optical-fiber sensor", <i>Applied Optics</i> Vol. 35, No. 22: 4522-4525 (August 1996).	<input type="checkbox"/>
		Boisde G., Harmer A. <i>Chemical and Biological Sensing with Optical Fibers and Waveguides</i> . Boston, MA: Artech House (1996).	<input type="checkbox"/>
		Moar PN, Huntington ST, Katsifolis J, Cahill LW, Roberts A, Nugent KA. "Fabrication, modeling and direct evanescent field measurement of tapered optical fiber sensors." <i>J. appl. Phys.</i> 85: 3395-3398 (1999).	<input type="checkbox"/>
		Zaatar Y, Zaouk D, Bechara J, Khouri A, Llinaress C, Charles JP. "Fabrication and characterization of an evanescent wave fiber optic sensor for air pollution control." <i>Mat. Sci. Eng.</i> B74: 296-298 (2000)	<input type="checkbox"/>
		Lee, SM, Yang C, Pan W. "Evanescent-coupling Fiber Optic Pollution Monitoring System Using Etched D-Shape E-Core Fiber." <i>Proc. SPIE-Int. Soc. Opt. Eng.</i> 2836: 267-274.	<input type="checkbox"/>
*	Francisco J. Arregui et. al., "Optical Fiber Strain Gauge Based on a Tapered Single-Mode Fiber," pages 90-96, July 26, 1999, <i>Sensors and Actuators</i> 70 (2000).	<input type="checkbox"/>	
'	Shankar, PM; Bobb, LC; Krumboltz, HD. "Coupling of modes in bent biconically tapered single-mode fibers." <i>Journal of Lightwave Technology</i> , 9 (7): 832-837 July 1991.	<input type="checkbox"/>	
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